Docket No.: 42390P1901R

Patent

AF

#25700

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Patent Application of:	)	Examiner: Lee, R.
Kuzma, Andrew J.	)	Art Unit: 2613
Serial No.: 08/881,965	)	
Filed: May 16, 1997	)	
For: METHOD AND APPARATUS FOR EXTENDING POINT TO POINT/ASYNCHRONOUS TRANSFER MODE SERVICES TO CLIENT COMPUTER SYSTEMS	)	

Honorable Commissioner of
Patents and Trademarks

APPEAL BRIEF TRANSMITTAL COVER LETTER

Sir:

Enclosed for filing in the U.S. Patent and Trademark office, before the Board of Patent Appeals and Interferences are (1) Appellant's Brief Pursuant to 37 C.F.R. § 1.192 (a), in triplicate; (2) Appendix to Appellant's Brief, in triplicate; (3) a check in the amount of $320.00 to cover the fee for filing the Appellant's Brief.

If any additional fee is required, please charge Deposit Account No. 02-2666. A duplicate of this transmittal is enclosed for deposit account charging purposes.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Date: August 26, 2002

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FIRST CLASS CERTIFICATE OF MAILING
(37 C.F.R. § 1.8(a))

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated below and is addressed to the Commissioner for Patents.

On Aug 26, 2002

Debbie Peloquin
Name of Person Mailing

Debbie Peloquin 8-26-02
Signature Date

PTO/SB/17(09-00)
Approved for use through 10/31/2002. OMB 0651-0032
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

FEE TRANSMITTAL FOR FY 2002

TOTAL AMOUNT OF PAYMENT ($) 320.00

Complete if Known:
Application No. 08/ 881,965
Filing Date May 16, 1997
First Named Inventor Kuzma
Group Art Unit 2613
Examiner Name Lee, R.
Attorney Docket No. 42390P1901R

METHOD OF PAYMENT (check one)

1. [X] **The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:**

   Deposit Account Number 02-2666
   Deposit Account Name _____

   [ ] **Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17**

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2. X **Payment Enclosed:**
   X **Check**
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FEE CALCULATION

1. **BASIC FILING FEE**

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
101	740	201	370	Utility application filing fee	
106	330	206	165	Design application filing fee	
107	510	207	255	Plant filing fee	
108	740	208	370	Reissue filing fee	
114	160	214	80	Provisional application filing fee	

SUBTOTAL (1) $_____

2. **EXTRA CLAIM FEES**

		Extra Claims		Fee from below		Fee Paid
Total Claims	_____	– 20** =	_____	X _____	=	_____
Independent Claims	____	– 3** =	_____	X _____	=	_____
Multiple Dependent				_____	=	_____

****Or number previously paid, if greater; For Reissues, see below.**

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
103	18	203	9	Claims in excess of 20
102	84	202	42	Independent claims in excess of 3
104	280	204	140	Multiple dependent claim, if not paid
109	84	209	42	**Reissue independent claims over original patent
110	18	210	9	**Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) $_____

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for ex-parte reexamination	
099	8,800	099	8,800	Request for inter partes reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for response within first month	
116	400	216	200	Extension for response within second month	
117	920	217	460	Extension for response within third month	
118	1,440	218	720	Extension for response within fourth month	
128	1,960	228	980	Extension for response within fifth month	
119	320	219	160	Notice of Appeal	
120	320	220	160	Filing a brief in support of an appeal	320.00
121	280	221	140	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive unavoidably abandoned application or unavoidably delayed payment of issue fee	
141	1,280	241	640	Petition to revive unintentionally abandoned application or unintentionally delayed payment of issue fee	
142	1,280	242	640	Utility issue fee (or reissue)	
143	460	243	230	Design issue fee	
144	620	244	310	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Petitions related to provisional applications	
126	180	126	180	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	
146	740	246	370	For filing a submission after final rejection (see 37 CFR 1.129(a))	
149	740	249	370	For each additional invention to be examined (see 37 CFR 1.129(b))	
179	740	279	370	Request for Continued Examination (RCE)	
169	900	169	900	Request for expedited examination of a design application	
Other fee (specify)					
Other fee (specify)					

SUBTOTAL (3) $ 320.00

*Reduced by Basic Filing Fee Paid

SUBMITTED BY:

Typed or Printed Name: Libby H. Hope

Signature: /Libby H. Hope/ Date: August 26, 2002

Reg. Number: 46,774 Telephone Number: 303-740-1980

#25
W. Lawson
9/5/02
1 of 3

Our Docket No.: 42390P1901R *Reissue Patent*

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Patent Application of: Kuzma, Andrew J.	
Serial No.: 08/881,965	Art Unit: 2613
Filed: May 16, 1997	Examiner: Lee, R.
For: METHOD AND APPARATUS FOR EXTENDING POINT TO POINT/ASYNCHRONOUS TRANSFER MODE SERVICES TO CLIENT COMPUTER SYSTEMS	

Honorable Commissioner of
Patents and Trademarks
Washington, D.C. 20231

APPEAL BRIEF
IN SUPPORT OF APPELLANTS' APPEAL
TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

Sir:

Applicant (hereafter "Appellant") hereby submits this Brief in triplicate in support of an appeal from a final decision by the Examiner, mailed June 21, 2002 in the above-captioned case. Appellant respectfully requests consideration of this appeal by the Board of Patent Appeals and Interferences for allowance of the above-captioned patent application.

An oral hearing is not desired.

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B. REJECTION OF CLAIMS 33 AND 36 UNDER 35 U.S.C. §103(A) AS BEING UNPATENTABLE OVER MURAKAMI ET AL., BARBERIS ET AL., AND PARRISH ET AL., IN FURTHER VIEW OF JEONG, WAS IMPROPER 12

C. REJECTION OF CLAIMS 29, 30, AND 37 UNDER 35 U.S.C. §103(A) AS BEING UNPATENTABLE OVER MURAKAMI ET AL., BARBERIS ET AL., AND PARRISH ET AL., IN FURTHER VIEW OF KHALIL, WAS IMPROPER. 13

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I. REAL PARTY IN INTEREST

The invention is assigned to Intel Corporation of 2200 Mission College Boulevard, Santa Clara, California 95052-8119.

II. RELATED APPEALS AND INTERFERENCES

To the best of Appellants' knowledge, there are no appeals or interferences related to the present appeal that will directly affect, be directly affected by, or have a bearing on the Board's decision.

III. STATUS OF THE CLAIMS

Claims 1, 22-33, 35-39, and 41-49 are currently pending in the above-referenced application. Claim 1, which was the only claim in the issued patent on which this reissue is based, has been allowed. Claims 22-33, 35-39, and 41-49 were rejected in the Final Office Action mailed June 21, 2002, and are the subject of this appeal. All claims stand rejected under 35 U.S.C. § 103(a).

IV. STATUS OF AMENDMENTS

No amendments were submitted in response to the Final Office Action mailed on June 21, 2002, rejecting claims 22-33, 35-39, and 41-49. A copy of all claims on appeal is attached hereto as Appendix A. Additionally, to comply with MPEP §1454, Appendix B is also attached to include "all underlining and bracketing necessary to reflect the changes made to the patent claims during the prosecution of the reissue application," and to ensure that any new claims are "completely underlined."

V. SUMMARY OF THE INVENTION

At the time of filing this application, the current state of the art was such that video algorithms assumed a nearly constant bandwidth availability for the encoding of video information, which was evidenced by the use of only a *single output buffer* for traditional video encoder output. It was common to use the output buffer fullness as a feedback parameter for encoding subsequent images, i.e. with higher or lower levels of quantization. A well-known effect resulting from using a single output buffer is called "bit-bang" where the output buffer is over depleted by the interface to the communications channel, causing the feedback loop to indicate that the buffer can handle lots of data, which in turns causes the video compression algorithm to under-optimize the subsequent image coding. The user perceives the bit-bang as an uneven quality and frame rate.

To alleviate the bit-bang effect, the typical approach had been to limit the amount of data pulled out from the encoder video output buffer to a fraction of the total size of the output buffer under the assumption that the communication channel would not change rapidly; typically, this fraction was 10% to 30%. This approach kept the feedback indicator rather small, and encoding more uniform. In a local area network (LAN), or other collision-sensing multiple access channel, or in other networks with burst characteristics (such as noisy RF channels), this underlying assumption no longer holds true. Over these types of communications channels, unanticipated transmission delays may result in bit-bang problems which are not so readily overcome by limiting the size of the

feedback buffer. As a result, video jerkiness is a problem in real-time video communication over channels.

Unlike the known prior art, *embodiments of the invention utilize multiple output buffers* that are *dynamically created and configured based on one or more characteristics of a communication channel* that is used for transmitting the encoded real-time information over a network. In other words, feedback from the communications channel to a video CODEC for capturing and encoding real-time information is used to *drive multiple video output buffers*. The multiple output buffers share an original temporal video reference, but have different subsequent temporal video images. The communications channel then picks the subsequent video image buffer that best matches the current conditions it is experiencing. By using a predictor of the channel performance, the video algorithm can be tuned to provide video output buffers with the best guess of how the buffers should be configured. A number of subsequent histories of an image are buffered until the receiving channel indicates it is ready to receive the next. Then the appropriate output buffer having the corresponding temporal change in the video is used to supply the next frame change information to the receiving station.

Claim 1 was the only claim in the issued patent that formed the basis for this reissue application. It was also allowed by the Examiner in the pending reissue application.

Claims 22-28, 31, 32, 35, 38, 39, and 41-49 were rejected by the Examiner, as discussed below.

VI. ISSUES PRESENTED

Whether claims 22-28, 31, 32, 35, 38, 39, and 41-49 are unpatentable under 35 U.S.C. §103(a) over Murakami et al. (U.S. Patent No. 5,010,401) in view of Barberis et al. (U.S. Patent No. 4,320,500), and Parrish et al. (U.S. Patent No. 5,117,350).

Whether claims 33 and 36 are unpatentable under 35 U.S.C. §103(a) over the combination of Murakami et al., Barberis et al., and Parrish et al., and further in view of Jeong (U.S. Patent No. 5,497,153).

Whether claims 29, 30, and 37 are unpatentable under 35 U.S.C. §103(a) over the combination of Murakami et al., Barberis et al., and Parrish et al., and further in view of Khalil (U.S. Patent No. 5,343,465).

VII. GROUPING OF CLAIMS

For the purposes of this appeal, the following groups of claims stand or fall together: claims 22-23; 24-33; 35-38; 39, 41; 42-43; 44-45; and 46-49.

VIII. ARGUMENT

A. REJECTION OF CLAIMS 22-28, 31, 32, 35, 38, 39, AND 41-49 UNDER 35 USC §103(A) AS BEING UNPATENTABLE OVER MURAKAMI ET AL., BARBERIS ET AL., AND PARRISH ET AL., WAS IMPROPER.

The Examiner rejected claims 22-28, 31, 32, 35, 38, 39, and 41-49 under 35 U.S.C. §103(a) as being unpatentable over Murakami et al., Barberis et al., and Parrish et al.

To establish a prima facie case of obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art reference (or references when combined). (M.P.E.P. §2143.03). While the rationale to modify or combine the prior art does not have to be expressly stated in the prior art, the rationale must at least be expressly or impliedly contained in the prior art or reasoned from knowledge generally available to one of ordinarily skill in the art, established scientific principles, or legal precedent established by prior case law. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The Examiner has failed to show that all claim limitations have been taught or suggested by the prior art references cited, or that the limitations that are missing from the cited prior art can be reasoned from knowledge generally available to one of ordinary skill in the art, established scientific principles, or legal precedent established by prior case law.

Murakami is missing at least one element required by the Applicant's invention as recited by the claims

Specifically, at least one limitation that is missing from the primary reference, Murakami et al. (Office Action dated March 8, 2002, page 3, line 14), is "*dynamically created output buffers that are created and configured based upon one or more characteristics of a communication channel to be used for transmitting the encoded real time information over a network*." The Examiner has argued that this element is "old and well recognized in the art, as exemplified

by Barberis et al." (Office Action dated March 8, 2002, page 4, lines 19-20). However, as detailed below, since Barberis does not teach or suggest this element, the Examiner has failed to otherwise show that such an element is old and well recognized in the art.

Barberis does not teach or suggest that element which is missing from Murakami

Barberis discloses a system for routing data from a transmitting buffer to a terminal node according to the delay that is computed for various paths to the terminal node. In Barberis, B_1-B_n are transmitting nodes, analogous to the "dynamically created output buffers" of the Applicants' invention as recited by the claims; W_1-W_n may be terminal nodes that correspond to transmitting nodes B_1-B_n, and that receive data transmitted from nodes B_1-B_n; and Y_1-Y_n are intermediate nodes where W_1-W_n exist, that correspond to transmitting nodes B_1-B_n, and that relay data to W_1-W_n that are transmitted from nodes B_1-B_n, or are terminal nodes where W_1-W_n do not exist. *In Barberis, each of buffers B_1-B_n is some predefined number*.

In Barberis, a route comprises a transmitting node B_i, a terminal node W_i, or Y_i and any number of intermediate nodes, Y_i, where i is a member of 1-n, and denotes some identifiable path shared by each of B_i, W_i, and Y_i. Data is transmitted along a route consisting of a transmitting node, B_1-B_n, a terminal node W_1-W_n or Y_1-Y_n, and intermediate nodes, Y_1-Y_n, if any, where the route is the route starting at B_i that has a calculated delay that is less than a calculated delay of some other path. In other words, if n=2, then "a packet destined for

terminal node W_2 (see FIG. 1A) may be routed ... over node Y_1 rather than over node Y_2 because the delay projected for transmission over buffer B_1 and nodes Y_1, W_1 could be less than the delay calculated for transmission over buffer B_2 and Y_2." (See column 4, lines 49-55.)

In Barberis, data is transferred from a receiving buffer BN to a single outgoing buffer, B_1-B_n, where the single, outgoing buffer is "selected to minimize the total delay experienced by the packet during transmission via the selected buffer and the path extending therefrom..." (column 4, lines 44-47).

The Applicant's invention as recited by the claims (hereinafter referred to as "Kuzma") differs from Barberis in many respects. First, Kuzma *creates dynamically created buffers*. This is in contrast to Barberis, where the buffers B_1-B_n are all *predefined*.

Secondly, Kuzma requires that data is transferred to all of the buffers, rather than just a single buffer as in Barberis. In Kuzma, all of the dynamically created buffers are populated with an "an original temporal video reference", and each of the buffers has "different subsequent temporal video images." (Kuzma, column 5, lines 34-35).

Thirdly, in Kuzma, buffers are dynamically created according to one or more characteristics of a communications channel to be used for transmitting the data. Since the buffers are created according to characteristics of a communications channel, and the characteristics of a communications channel may change, each of the buffers may contain different data. In Barberis, not only

is only one buffer populated (that which corresponds to a route having the shortest delay to the terminal node), but the existence of a given buffer in Barberis does not depend on the characteristics of its associated path (i.e., communication channel of Kuzma).

Furthermore, in Barberis, the buffer that is selected is that which minimizes the total delay experienced by the packet during transmission via the selected buffer and the path extending therefrom. In contrast, in Kuzma, the buffer that is selected is that which matches the current conditions of the communications channel, rather than the buffer that will transmit the fastest as in Barberis.

In summary, Barberis does not teach, as suggested by the Examiner, dynamically created buffers that are created and configured based upon one or more characteristics of a communication channel to be used for transmitting the data. Furthermore, Barberis does not suggest or provide motivation for creating dynamically configurable buffers. In Barberis, since there are multiple paths (i.e., communication channels) for transmitting data, each path possibly having different calculated delays, there is no need in Barberis for creating buffers that are dependent upon the characteristics of a single communications channel.

Parrish does not teach or suggest that element which is missing from Murakami

The Examiner has also argued that the "dynamically created and configurable output buffers based on one or more characteristics of a communication channel" element is shown in Parrish, and that Parrish "shows

such general use of dynamically created buffers that may obviously be provided for the buffering system of Barberis et al. and Murakami et al. thereby providing substantially the same if not the same plurality of dynamically created output buffers..."

Parrish discloses a computer system having a distributed memory architecture using an apparatus to connect memory units in order to facilitate software control of the storage and retrieval of data in a distributed architecture. Parrish does not teach or suggest dynamically configurable output buffers based on the characteristics of a communications channel. While configurable memories may be well known in the art, the Applicant does not herein claim to have invented configurable memories (i.e., dynamically created and configured output buffers). The Applicant specifically claims dynamically configurable output buffers that are configured *based upon characteristics of a communications channel* in the context of encoded real-time information as recited in the claims. Parrish does not teach, suggest, or provide the motivation for modifying its disclosure of configurable memories to create dynamically configurable output buffers for storing encoded real-time data, where the buffers are dynamically created and configured *based upon characteristics of a communications channel*.

The combination of Murakami, Barberis, and Parrish does not produce the Applicant's invention as recited by the claims

Even if the combination of Murakami, Barberis, and Parrish was proper, the combination does not produce the Applicant's invention as recited by the

claims. At best, the combination of these three references produces an apparatus that stores encoded and compressed data in multiple buffers (Barberis) that can be configured (Parrish). Since there is no suggestion in any of the teachings as to *how the buffers are to be configured*, it would take substantial modification of these combined references to produce the Applicant's invention as recited by the claims, essentially making the *invention nonobvious*.

Therefore, the Appellant respectfully submits that the Examiner's rejection of independent claims 22, 24, 35, 39, 42, 44, and 46 was improper, and requests that the Board overrule the Examiner and direct allowance of these rejected claims. Furthermore, it is submitted that the Examiner's rejection of corresponding dependent claims 23; 25-28, 31-32; 38; 41; 43; 45; 47-49 was also improper, since these claims inherit the limitations of their independent claims, and add further limitations, and requests that the Board overrule the Examiner and direct allowance of these rejected claims

B. REJECTION OF CLAIMS 33 AND 36 UNDER 35 U.S.C. §103(A) AS BEING UNPATENTABLE OVER MURAKAMI ET AL., BARBERIS ET AL., AND PARRISH ET AL., IN FURTHER VIEW OF JEONG, WAS IMPROPER

If an independent claim is nonobvious under 35 U.S.C. §103(a), then any claim depending therefrom is nonbvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). M.P.E.P. 2143.03

Since claim 33 depends from claim 24, and since claim 36 depends from claim 35, and since it is believed that claims 24 and 35 are nonobvious, it is axiomatic that claims 33 and 36 are nonobvious as well. Therefore, the Appellant respectfully submits that the Examiner's rejection of claims 33 and 36 was improper, and requests that the Board overrule the Examiner and direct allowance of these rejected claims.

C. REJECTION OF CLAIMS 29, 30, AND 37 UNDER 35 U.S.C. §103(A) AS BEING UNPATENTABLE OVER MURAKAMI ET AL., BARBERIS ET AL., AND PARRISH ET AL., IN FURTHER VIEW OF KHALIL, WAS IMPROPER.

If an independent claim is nonobvious under 35 U.S.C. §103(a), then any claim depending therefrom is nonbvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). M.P.E.P. 2143.03

Since claims 29 and 30 depend from claim 24, and since claim 37 depends from claim 35, and since it is believed that claims 24 and 35 are nonobvious, it is axiomatic that claims 29, 30, and 37 are nonobvious as well. Therefore, the Appellant respectfully submits that the Examiner's rejection of claims 29, 30, and 37 was improper, and requests that the Board overrule the Examiner and direct allowance of these rejected claims.

VII. CONCLUSION

Appellant respectfully submits that all the appealed claims in this application are patentable and request that the Board of Patent Appeals and Interferences overrule the Examiner and direct allowance of the rejected claims.

This brief is submitted in triplicate, along with a check for $320.00 to cover the appeal fee for one other than a small entity as specified in 37 C.F.R. § 1.17(c). Please charge any shortages and credit any overpayment to our Deposit Account No. 02-2666.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN

Date: August 26, 2002

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APPENDIX A (37 C.F.R. § 1.192(C)(7)

1. For use in a communications network having a plurality of nodes wherein a node may encode real-time information for propagating over said network, a method of processing said real-time information comprising:

providing said node with a plurality of output buffers;

(a) electronically capturing said real-time information and converting it into electronic data;

(b) differentially encoding said electronic data using a previously stored transmit image as a base to produce differential data;

(c) storing said differential data in one of said plurality of output buffers;

(d) monitoring said network for access to propagate said differential data;

repeating steps (a)-(d) until said node may propagate said differential data over said network;

transmitting data over said network from the one of said plurality of output buffers providing a best differential data to a receiving node on said network, wherein said best differential data represents a differential data whose use in conjunction with the previously stored transmit

reference image produces an image that approximates a current frame better than use of other differential data contained in said plurality of output buffers; and

calculating a new transmit reference image based on said best differential data and said previously stored transmit reference image.

22. An apparatus comprising:

an encoder for producing encoded real-time information;

a transmit reference buffer for storing a current transmit reference;

compression circuitry coupled to the encoder and to the transmit reference buffer for producing compressed data based upon the current transmit reference and the encoded real-time information;

a plurality of dynamically created output buffers coupled to the compression circuitry for storing the compressed data, each dynamically created output buffer being created and configured based upon one or more characteristics of a communication channel to be used for transmitting the encoded real-time information over a network; and

a network interface coupled to the plurality of dynamically created output buffers, the network interface for interfacing with the network, for determining a selected output buffer from the plurality of dynamically created output buffers and for transmitting data over

the network from the selected output buffer, the selected output buffer containing compressed data which accommodates the one or more characteristics of the network better than compressed data in at least one other buffer of the plurality of dynamically created output buffers.

23. The apparatus of claim 22, wherein the selected output buffer contains compressed data which accommodates one or more characteristics of the network better than compressed data in all other buffers of the plurality of output buffers.

24. An apparatus for transmitting real-time information over a network, the apparatus comprising:

an encoder for producing encoded real-time information;

a transmit reference buffer for storing a current transmit reference;

compression circuitry coupled to the encoder and to the transmit reference buffer for producing compressed data based upon the current transmit reference and the encoded real-time information; and

a plurality of dynamically created output buffers coupled to the compression circuitry for buffering the compressed data, each of the plurality of dynamically created output buffers having contents and being created and configured based upon one or more characteristics of a communication channel to be used for

transmitting the encoded real-time information over a network, the contents of a selected output buffer of the plurality of dynamically created output buffers to be transmitted onto a data communications channel of the network based upon the one or more characteristics of the data communications channel.

25. The apparatus of claim 24 further comprising a network interface coupled to the plurality of output buffers, the network interface for interfacing with the network, the network interface determining the selected output buffer and transmitting data over the network from the selected output buffer.

26. The apparatus of claim 25, wherein the selected output buffer contains compressed data which, when used in conjunction with the current transmit reference, accommodates the one or more characteristics of the data communications channel better than compressed data from at least another buffer of the plurality of output buffers.

27. The apparatus of claim 25, wherein the selected output buffer contains compressed data which, when used in conjunction with the current transmit reference, accommodates the one or more characteristics of the data communications channel better than compressed data from all other buffers of the plurality of output buffers.

28. The apparatus of claim 24, wherein the compressed data comprises a differential between the encoded real-time information and the current transmit reference.

29. The apparatus of claim 24, wherein the one or more characteristics of the data communications channel include bandwidth availability on the data communications channel.

30. The apparatus of claim 24, wherein the one or more characteristics of the data communications channel include burstiness of traffic on the data communications channel.

31. The apparatus of claim 24, wherein the one or more characteristics of the data communications channel include transmission delay on the data communications channel.

32. The apparatus of claim 24, wherein the encoded real-time information includes video information.

33. The apparatus of claim 24, wherein the encoded real-time information includes audio information.

35. An apparatus comprising:

an encoder for producing encoded real-time information;

a transmit reference buffer for storing a current transmit reference;

compression circuitry coupled to the encoder and to the transmit reference buffer for producing compressed data based upon the current transmit reference and the encoded real-time information;

a plurality of dynamically created output buffers coupled to the

compression circuitry for storing the compressed data, each dynamically created output buffer being created and configured based upon one or more characteristics of a communication channel to be used for transmitting the encoded real-time information over a network; and

a network interface coupled to the plurality of output buffers, the network interface for selecting a selected output buffer of the plurality of output buffers by determining, with reference to one or more predetermined coding strategies, whether compressed data from the selected output buffer is appropriate for transmission to a receiving node.

36. The apparatus of claim 35, wherein the one or more predetermined coding strategies include minimizing artifacts.

37. The apparatus of claim 35, wherein the one or more predetermined coding strategies include allocating available bandwidth to achieve a higher frame rate.

38. The apparatus of claim 35, wherein each of the output buffers is dynamically created and configured in accordance with characteristics of a communication channel being used to transmit the encoded real-time information over the network.

39. An apparatus comprising:

an encoder for producing encoded real-time information;

compression circuitry coupled to the encoder for producing compressed data based upon a previously stored transmit reference and the encoded real-time information;

a plurality of dynamically created output buffers coupled to the compression circuitry for storing the compressed data, each dynamically created output buffer being created and configured based upon one or more characteristics of a communication channel to be used for transmitting the encoded real-time information over a network; and

a network interface coupled to the plurality of dynamically created output buffers, the network interface transmitting compressed data from a selected output buffer of the plurality of dynamically created output buffers, the compressed data from the selected output buffer when used in conjunction with the previously stored transmit reference approximating a next frame expected by a receiving apparatus.

41. The apparatus of claim 39, wherein the selected output buffer is selected based upon current conditions of a communication channel to be used for transmitting the contents of the selected output buffer.

42. A method of transmitting data over a network comprising:

encoding the data by determining the differences between the data and a

transmit reference to produce differential data;

storing the differential data in a plurality of output buffers dynamically created based upon characteristics of a communication channel to be used for transmitting the differential data over the network;

selecting one of the plurality of output buffers as a current transmit buffer based upon current conditions of a communications channel in the network used to transmit the differential data; and

transmitting the differential data from the current transmit buffer over the network.

43. The method of claim 42, additionally comprising compressing the differential data prior to storing the differential data in one of the plurality of output buffers.

44. A method of transmitting real-time data over a network comprising:

encoding the real-time data by determining the differences between the real-time data and a transmit reference to produce differential data;

storing the differential data in one of a plurality of output buffers, each output buffer dynamically created based upon one or more characteristics of a data communications channel of the network;

selecting one of the plurality of output buffers as a current transmit buffer by determining whether the differential data in a particular output buffer accommodates one or more characteristics of the network

better than differential data in at least one other output buffer of the plurality of output buffers; and

transmitting differential data from the current transmit buffer over the network.

45. The method of claim 44, additionally comprising compressing the differential data prior to storing the differential data in one of the plurality of output buffers.

46. An apparatus comprising:

an encoder for producing encoded real-time information;

compression circuitry coupled to the encoder for producing compressed data based upon a previously stored transmit reference and the encoded real-time information;

a plurality of dynamically created output buffers coupled to the compression circuitry for storing the compressed data, each buffer being configured in accordance with characteristics of a communication channel to be used for transmitting the encoded real-time information over a network; and

a network interface coupled to the plurality of output buffers, the network interface transmitting compressed data from a selected output buffer of the plurality of output buffers, the compressed data from the selected output buffer when used in conjunction with the

previously stored transmit reference approximating a next frame expected by a receiving apparatus.

47. The method of claim 46, wherein said encoder produces encoded real-time information by determining the differences between the real time information and a transmit reference.

48. The method of claim 42, additionally comprising repeating said encoding, storing, selecting, and transmitting using the data from the current transmit buffer as the transmit reference.

49. The method of claim 44, additionally comprising repeating said encoding, storing, selecting, and transmitting using the data from the current transmit buffer as the transmit reference.

APPENDIX B (MPEP §1454)

1. For use in a communications network having a plurality of nodes wherein a node may encode real-time information for propagating over said network, a method of processing said real-time information comprising:

providing said node with a plurality of output buffers;

(a) electronically capturing said real-time information and converting it into electronic data;

(b) differentially encoding said electronic data using a previously stored transmit image as a base to produce differential data;

(c) storing said differential data in one of said plurality of output buffers;

(d) monitoring said network for access to propagate said differential data;

repeating steps (a)-(d) until said node may propagate said differential data over said network;

transmitting data over said network from the one of said plurality of output buffers providing a best differential data to a receiving node on said network, wherein said best differential data represents a differential data whose use in conjunction with the previously stored transmit

reference image produces an image that approximates a current frame better than use of other differential data contained in said plurality of output buffers; and

calculating a new transmit reference image based on said best differential data and said previously stored transmit reference image.

2. An apparatus comprising:

an encoder for producing encoded real-time information;

a transmit reference buffer for storing a current transmit reference;

compression circuitry coupled to the encoder and to the transmit reference buffer for producing compressed data based upon the current transmit reference and the encoded real-time information;

a plurality of output buffers coupled to the compression circuitry for storing the compressed data; and

a network interface coupled to the plurality of output buffers, the network interface for interfacing with a network, for determining a selected output buffer from the plurality of output buffers and for transmitting data over the network from the selected output buffer, the selected output buffer containing compressed data which accommodates one or more characteristics of the network better than at least compressed data in another buffer of the plurality of output buffers.

3. The apparatus of claim 2, wherein the selected output buffer contains

compressed data which accommodates one or more characteristics of the network better than compressed data in all other buffers of the plurality of output buffers.

4. An apparatus for transmitting real-time information over a network, the apparatus comprising:

an encoder for producing encoded real-time information;

a transmit reference buffer for storing a current transmit reference;

compression circuitry coupled to the encoder and to the transmit reference buffer for producing compressed data based upon the current transmit reference and the encoded real-time information; and

a plurality of output buffers coupled to the compression circuitry for buffering the compressed data, each of the plurality of output buffers having a contents, the contents of a selected output buffer of the plurality of output buffers to be transmitted onto a data communications channel of a network based upon one or more characteristics of the data communications channel.

5. The apparatus of claim 4 further comprising a network interface coupled to the plurality of output buffers, the network interface for interfacing with the network, the network interface determining the selected output buffer and transmitting data over the network from the selected output buffer.

6. The apparatus of claim 5, wherein the selected output buffer contains compressed data which, when used in conjunction with the current transmit reference, accommodates the one or more characteristics of the data communications channel better than compressed data from at least another buffer of the plurality of output buffers.

7. The apparatus of claim 5, wherein the selected output buffer contains compressed data which, when used in conjunction with the current transmit reference, accommodates the one or more characteristics of the data communications channel better than compressed data from all other buffers of the plurality of output buffers.

8. The apparatus of claim 4, wherein the compressed data comprises a differential between the encoded real-time information and the current transmit reference.

9. The apparatus of claim 4, wherein the one or more characteristics of the data communications channel include bandwidth availability on the data communications channel.

10. The apparatus of claim 4, wherein the one or more characteristics of the data communications channel include burstiness of traffic on the data communications channel.

11. The apparatus of claim 4, wherein the one or more characteristics of the data communications channel include transmission delay on the data communications channel.

12. The apparatus of claim 4, wherein the encoded real-time information includes video information.

13. The apparatus of claim 4, wherein the encoded real-time information includes audio information.

14. An apparatus for transmitting real-time information over a network, the apparatus comprising:

an encoder for producing encoded real-time information;

a transmit reference buffer for storing a current transmit reference;

compression circuitry coupled to the encoder and to the transmit reference buffer for producing compressed data based upon the current transmit reference and the encoded real-time information; and

a plurality of output buffers coupled to the compression circuitry, the plurality of output buffers for storing the compressed data to be transmitted onto the network from one of the plurality of output buffers.

15. An apparatus comprising:

an encoder for producing encoded real-time information;

a transmit reference buffer for storing a current transmit reference;

compression circuitry coupled to the encoder and to the transmit reference buffer for producing compressed data based upon the current transmit reference and the encoded real-time information;

a plurality of output buffers coupled to the compression circuitry for storing the compressed data; and

a network interface coupled to the plurality of output buffers, the network interface for selecting a selected output buffer of the plurality of output buffers by determining, with reference to one or more predetermined coding strategies, whether compressed data from the selected output buffer is appropriate for transmission to a receiving node.

16. The apparatus of claim 15, wherein the one or more predetermined coding strategies include minimizing artifacts.

17. The apparatus of claim 15, wherein the one or more predetermined coding strategies include allocating available bandwidth to achieve a higher frame rate.

18. An apparatus comprising:

an encoder for producing encoded real-time information;

compression circuitry coupled to the encoder for producing compressed data based upon a previously stored transmit reference and the encoded real-time information;

a plurality of output buffers coupled to the compression circuitry for storing the compressed data; and

a network interface coupled to the plurality of output buffers, the network interface transmitting compressed data from a selected output buffer of the plurality of output buffers, the compressed data from the selected output buffer when used in conjunction with the previously stored transmit reference approximating a next frame expected by a receiving apparatus.

19. A method of transmitting data over a network comprising the steps of:

encoding the data by determining the differences between the data and a transmit reference to produce differential data;

storing the differential data in one of a plurality of output buffers;

selecting one of the plurality of output buffers as a current transmit buffer based upon one or more characteristics of a data communications channel of a network; and

transmitting differential data from the current transmit buffer over the network.

20. A method of transmitting real-time data over a network comprising the steps of:

encoding the real-time data by determining the differences between the real-time data and a transmit reference to produce differential data;

storing the differential data in one of a plurality of output buffers;

selecting one of the plurality of output buffers as a current transmit buffer by determining whether the differential data in a particular transmit buffer accommodates the one or more characteristics of the network better than differential data in at least another buffer of the plurality of output buffers; and

transmitting differential data from the current transmit buffer over the network.]

22. An apparatus comprising:

an encoder for producing encoded real-time information;

a transmit reference buffer for storing a current transmit reference;

compression circuitry coupled to the encoder and to the transmit reference buffer for producing compressed data based upon the current transmit reference and the encoded real-time information;

a plurality of dynamically created output buffers coupled to the compression circuitry for storing the compressed data, each

dynamically created output buffer being created and configured based upon one or more characteristics of a communication channel to be used for transmitting the encoded real-time information over a network; and

a network interface coupled to the plurality of dynamically created output buffers, the network interface for interfacing with the network, for determining a selected output buffer from the plurality of dynamically created output buffers and for transmitting data over the network from the selected output buffer, the selected output buffer containing compressed data which accommodates the one or more characteristics of the network better than compressed data in at least one other buffer of the plurality of dynamically created output buffers.

23. The apparatus of claim 22, wherein the selected output buffer contains compressed data which accommodates one or more characteristics of the network better than compressed data in all other buffers of the plurality of output buffers.

24. An apparatus for transmitting real-time information over a network, the apparatus comprising:

an encoder for producing encoded real-time information;

a transmit reference buffer for storing a current transmit reference;

compression circuitry coupled to the encoder and to the transmit reference buffer for producing compressed data based upon the current transmit reference and the encoded real-time information; and

a plurality of dynamically created output buffers coupled to the compression circuitry for buffering the compressed data, each of the plurality of dynamically created output buffers having contents and being created and configured based upon one or more characteristics of a communication channel to be used for transmitting the encoded real-time information over a network, the contents of a selected output buffer of the plurality of dynamically created output buffers to be transmitted onto a data communications channel of the network based upon the one or more characteristics of the data communications channel.

25. The apparatus of claim 24 further comprising a network interface coupled to the plurality of output buffers, the network interface for interfacing with the network, the network interface determining the selected output buffer and transmitting data over the network from the selected output buffer.

26. The apparatus of claim 25, wherein the selected output buffer contains compressed data which, when used in conjunction with the current transmit reference, accommodates the one or more characteristics of the data communications channel better than compressed data from at least another buffer of the plurality of output buffers.

27. The apparatus of claim 25, wherein the selected output buffer contains compressed data which, when used in conjunction with the current transmit reference, accommodates the one or more characteristics of the data communications channel better than compressed data from all other buffers of the plurality of output buffers.

28. The apparatus of claim 24, wherein the compressed data comprises a differential between the encoded real-time information and the current transmit reference.

29. The apparatus of claim 24, wherein the one or more characteristics of the data communications channel include bandwidth availability on the data communications channel.

30. The apparatus of claim 24, wherein the one or more characteristics of the data communications channel include burstiness of traffic on the data communications channel.

31. The apparatus of claim 24, wherein the one or more characteristics of the data communications channel include transmission delay on the data communications channel.

32. The apparatus of claim 24, wherein the encoded real-time information includes video information.

33. The apparatus of claim 24, wherein the encoded real-time information includes audio information.

35. An apparatus comprising:

an encoder for producing encoded real-time information;

a transmit reference buffer for storing a current transmit reference;

compression circuitry coupled to the encoder and to the transmit reference buffer for producing compressed data based upon the current transmit reference and the encoded real-time information;

a plurality of dynamically created output buffers coupled to the compression circuitry for storing the compressed data, each dynamically created output buffer being created and configured based upon one or more characteristics of a communication channel to be used for transmitting the encoded real-time information over a network; and

a network interface coupled to the plurality of output buffers, the network interface for selecting a selected output buffer of the plurality of output buffers by determining, with reference to one or more predetermined coding strategies, whether compressed data from the selected output buffer is appropriate for transmission to a receiving node.

36. The apparatus of claim 35, wherein the one or more predetermined coding strategies include minimizing artifacts.

37. The apparatus of claim 35, wherein the one or more predetermined coding

strategies include allocating available bandwidth to achieve a higher frame rate.

38. The apparatus of claim 35, wherein each of the output buffers is dynamically created and configured in accordance with characteristics of a communication channel being used to transmit the encoded real-time information over the network.

39. An apparatus comprising:

an encoder for producing encoded real-time information;

compression circuitry coupled to the encoder for producing compressed data based upon a previously stored transmit reference and the encoded real-time information;

a plurality of dynamically created output buffers coupled to the compression circuitry for storing the compressed data, each dynamically created output buffer being created and configured based upon one or more characteristics of a communication channel to be used for transmitting the encoded real-time information over a network; and

a network interface coupled to the plurality of dynamically created output buffers, the network interface transmitting compressed data from a selected output buffer of the plurality of dynamically created output buffers, the compressed data from the selected output buffer when

used in conjunction with the previously stored transmit reference approximating a next frame expected by a receiving apparatus.

41. The apparatus of claim 39, wherein the selected output buffer is selected based upon current conditions of a communication channel to be used for transmitting the contents of the selected output buffer.

42. A method of transmitting data over a network comprising:

encoding the data by determining the differences between the data and a transmit reference to produce differential data;

storing the differential data in a plurality of output buffers dynamically created based upon characteristics of a communication channel to be used for transmitting the differential data over the network;

selecting one of the plurality of output buffers as a current transmit buffer based upon current conditions of a communications channel in the network used to transmit the differential data; and

transmitting the differential data from the current transmit buffer over the network.

43. The method of claim 42, additionally comprising compressing the differential data prior to storing the differential data in one of the plurality of output buffers.

44. A method of transmitting real-time data over a network comprising:

encoding the real-time data by determining the differences between the real-time data and a transmit reference to produce differential data;

storing the differential data in one of a plurality of output buffers, each output buffer dynamically created based upon one or more characteristics of a data communications channel of the network;

selecting one of the plurality of output buffers as a current transmit buffer by determining whether the differential data in a particular output buffer accommodates one or more characteristics of the network better than differential data in at least one other output buffer of the plurality of output buffers; and

transmitting differential data from the current transmit buffer over the network.

45. The method of claim 44, additionally comprising compressing the differential data prior to storing the differential data in one of the plurality of output buffers.

46. An apparatus comprising:

an encoder for producing encoded real-time information;

compression circuitry coupled to the encoder for producing compressed data based upon a previously stored transmit reference and the encoded real-time information;

a plurality of dynamically created output buffers coupled to the

compression circuitry for storing the compressed data, each buffer being configured in accordance with characteristics of a communication channel to be used for transmitting the encoded real-time information over a network; and

a network interface coupled to the plurality of output buffers, the network interface transmitting compressed data from a selected output buffer of the plurality of output buffers, the compressed data from the selected output buffer when used in conjunction with the previously stored transmit reference approximating a next frame expected by a receiving apparatus.

47. The method of claim 46, wherein said encoder produces encoded real-time information by determining the differences between the real time information and a transmit reference.

48. The method of claim 42, additionally comprising repeating said encoding, storing, selecting, and transmitting using the data from the current transmit buffer as the transmit reference.

49. The method of claim 44, additionally comprising repeating said encoding, storing, selecting, and transmitting using the data from the current transmit buffer as the transmit reference.